

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2004/006419

International filing date (day/month/year)
06.05.2004

Priority date (day/month/year)
07.05.2003

International Patent Classification (IPC) or both national classification and IPC
B41J2/21

Applicant
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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**International application No.
PCT/JP2004/006419**JC05 Rec'd PCT/PTO 19 SEP 2005****Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/006419

Box No. V Reasoned statement under Rule 43*b/s*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11, 14,15,19
	No: Claims	12,13,16-18
Inventive step (IS)	Yes: Claims	2-4,8,14,15,19
	No: Claims	1,5-7,9-13,16-18
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: EP-A-0739743

D2: EP-A-1029688

1. Lack of clarity, Article 6 PCT

- 1.1 Claims 1-7 and 12-19 have been drafted as separate independent claims. The plurality of independent claims renders difficult, if not impossible, to determine the matter for which protection is sought and places an undue burden on others seeking to establish the extent of protection (Article 6 and Rule 6.1(a) PCT).
- 1.2 Furthermore, it seems that claims 3 and 4 comprise all the features of claim 2, and that claims 6 and 7 comprise all the features of claim 5. Claims 3, 4, 6 and 7 are therefore not appropriately formulated as claims dependent on claim 2 and 5 respectively (Rule 6.4 PCT).
- 1.3 Some of the features in the apparatus claims 12-19 relate to a method of using the apparatus rather than clearly defining the apparatus in terms of its technical features. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.

2. Lack of novelty, Article 33(2) PCT

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 12, 13, 16, 17 and 18 is not new in the sense of Article 33(2) PCT.

Claims 12, 13, 16, 17 and 18 all disclose the following technical features (see point 1.3 above):

an ink jet printing apparatus comprising a row of ink ejecting orifices, a row of reacting liquid orifices, scanning means and feeding means.

Claims 13 and 16 additionally define that the row of reacting liquid ejection orifices is located at an upstream side of the row of ink ejection orifices in the printing medium feeding direction, and claims 17 and 18 additionally define that there are (n) ink ejection orifices and (n) reacting liquid orifices and that the rows of orifices are arranged to be adjacent to each other in an array direction of the orifices.

All these features are disclosed in document D1, see in particular p.9, l.27-31 and fig.2 of this document.

3. Lack of inventive step, Article 33(3) PCT

- 3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 and 5-7 does not involve an inventive step in the sense of Article 33(3) PCT.

The document D1 is regarded as being the closest prior art to the subject-matter of these claims, and insofar as can be understood (see point 1.1 above), this document shows the following features thereof (see in particular p.9, l.27-38 and figs.2-3 of D1):

a method of printing comprising the steps of
scanning a row of ink ejection orifices and a row of reacting liquid orifices to eject the ink and the reacting liquid onto a printing medium; and
feeding the printing medium; wherein
the scanning step is performed so that the scanning area of the ink and a scanning area of the reacting liquid during a single scan are adjacent to each other in a feeding direction of the printing medium and are of equal width in the feeding direction of the printing medium.

The subject-matter of claims differs from the disclosure of D1 in that the feeding step feeds the printing medium an amount which is a predetermined amount shorter than the width of the scanning areas so that ejection of the ink and/or the

reacting liquid onto a first scanning area corresponding to a width of the predetermined amount within the scanning area of the ink/reacting liquid is performed during two times of scan, and ejection onto a second scanning area other than said first scanning area is performed during a single scan. This is done to reduce banding of the printed image.

However, this feeding technique is well known in the field of ink jet printing to reduce banding, and is e.g. described in document D2 (see in particular par.9-14 and fig.4 of D2). The skilled person would therefore regard it as a normal option to use this technique in the method described in document D1 in order reduce banding of the printed image. D2 further discloses the overlapping area as being in the end portion of the orifice row, and that ejection with these end orifices is performed with less than 100% printability duty whereas ejection with the central orifices is performed at 100% printability duty.

- 3.2 Dependent claims 9-11 do not seem to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, see documents D1 and D2 and the corresponding passages cited in the search report.

4. Further remarks

Independent claims 2-4, 14, 15 and 19 seem to meet the requirements of the PCT with respect to novelty and inventive step in view of the prior art at hand. The subject-matter of these claims differs from the disclosure of the prior art in that the scanning area of the reacting liquid ejection orifices is shorter than the scanning area of the ink ejection orifices in the printing medium feeding direction, or correspondingly that the number of reacting liquid ejection orifices is less than the number of ink ejection orifices. This idea is also expressed in dependent claim 8.